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ABSTRACT

Three of four related papers presented at this symposium are included in this collection together with a brief descriptive introduction. These papers presented viewpoints about the social, political, and economic issues surrounding the use of computers in schools; each of the five presenters addressed a particular aspect of a critical social issue. The three papers are: (1) "Educational Computing and School Change: Influences on Teachers' Roles and Pedagogy" (Nancy Nelson Knupfer); (2) "Education as Marketplace" (Howard Besser); and (3) "Computers and Copyright: The Unpopular Dilemma" (Landra L. Rezabek). (BBM)

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Title:

Educational Computing: Social Considerations

A SYMPOSIUM

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Educational Computing: Social Considerations

This symposium presented a collection of four related papers and viewpoints about the social, political, and economic issues surrounding the use of computers in schools. Participants in this session hoped to make the audience aware of some of the major social issues surrounding the use of computers in education, cause them to reflect upon the effects of particular research findings and applications currently being implemented in education, and provide direction for those in positions to implement educational innovations.

Each of five presenters provided an important perspective on educational issues related to the use of computer technology in schools, its conceptualization, practices, effects, or implications. We hoped to provide a collection of ideas that have been traditionally ignored in teacher education and graduate studies, but beg to be addressed. It is from this perspective that we formed the contents and context of this symposium.

Each presenter addressed a particular aspect of a critical social issue related to the presence of computers in the schools. These issues include the teacher's changing role and the effects of computers on teachers, students, curriculum and knowledge; the question of education as a marketplace; copyright concerns and implications for educational practice; and finally, instructional design and human praxis.

EDUCATIONAL COMPUTING AND SCHOOL CHANGE:

INFLUENCES ON TEACHERS' ROLES AND PEDAGOGY

Dr. Nancy Nelson Knupfer
Kansas State University

Technological advancements have stimulated the widespread diffusion of microcomputers across all levels of our economy and society, thus creating a demand for substantive computer education. This computer education includes learning about computers as well as learning with computers.

Learning about computers changes the curriculum in an obvious way while learning with computers changes the curriculum and pedagogy in ways that go beyond the obvious. Furthermore, those changes reach beyond the school curriculum as we know it and into the social, economic, and political structure of our lives.

Although parents, government, and school officials recognize that students must prepare for citizenship in a computer-based society, the mere acquisition of computers for the schools is but one small facet of the much larger and more complex task: the implementation of this potentially significant innovation in education and the consequent formation of durable patterns of computer use and application by students and teachers long into the future.

The careful planning and proper implementation of informed computer education agendas, free from unreasonable expectations, will determine the value of this innovation (Goodlad, 1975; Romberg & Price, 1981). Further, the success of any such implementation effort will depend largely upon the teachers who determine the daily school activities (Cuban, 1986). Indeed, the personal and professional relationships among teachers, students, and administrators can have a greater influence on the future of any proposed innovation than the most generous outlays of money and machines.

The computer's conquest of American schools is more sweeping and complete than that of any technological innovation in memory. Around the country, principals, teachers, and parents point with pride to the serried ranks of monitor screens in their school computing labs while they battle with legislators over funding for more machines and software. Indeed, the question of implementing computer technology has already shifted from the problem of acquiring and finding uses for computers to the problem of handling existing sets of systems, software, and computer skills already in place.

The ironies of the situation are remarkable: a machine designed simply to process and transmit information has become the tool of choice in the school system's campaign to foster literacy, transmit culture, inculcate basic civic values, and train students for a competitive economy. It is perhaps understandable that a machine touted as the vanguard of the great new age of information processing and control would be so critical to yet another of American education's countless crusades to improve society (Ravitch, 1988). And like other educational innovations, the ongoing integration of computers into education occurs in an atmosphere clouded by bewilderment, optimism, confusion, skepticism, prejudice, and hope.

An accurate view of educational change and implementation of innovations considers the potential alterations that innovations cause in the school's learning environment (Berman, 1981; Berman & McLaughlin, 1978; Sarason, 1982). For example, the introduction of computers might change the grouping of students or the amount and quality of interactions between students and teachers, or the very pedagogy of lesson structure. Further, recent research indicates that changes in teachers' roles are

emerging, which in turn change their relationships with other teachers and with administrators.

Implementing computer technology in schools has brought about some obvious changes along with changes which are more subtle, yet carry a full impact. These changes affect individual lesson pedagogy as well as the overall curriculum strategy, the relationship between teachers, the emphasis of inservice training, specific teaching duties, and changes in institutional structure. The subtle changes can be just as powerful as the more obvious changes concerning their social effects on schools.

It is a commonplace to note that the student lies at the center of this drama, while the teacher's role in the acceptance, implementation, and outcome of educational computing has received less attention, even though an overwhelming body of evidence points to the centrality of teachers in the process of educational innovation. It is most important to realize that the teachers' existing attitudes, skills, and working habits will have great influence on their acceptance, style of implementation, and outcome regarding educational computing (see Figure 1). The interaction between the teacher and the computer has multiple dimensions way beyond the obvious problems of the machine's efficacy with students. We must ask, for example, the following questions.

How does the broad spectrum of teachers' attitudes about computers and their desirability limit or enhance the coordination of computers with the curriculum? Do teachers' prejudices about computers, independent of their biases about the social or educational condition of students, affect the way computers are located, controlled, and used in schools? How do teachers' fears and expectations about the impact of computers on their workloads, daily routines, and control over students and classtime affect their decisions about supervising and grouping students for computer use? These questions, part of what might be termed the sociology of educational computing, point directly to the teacher's role in implementing computers.

Social Interaction Model of Implementing Computers

The current method of implementing computers in the schools is based on a "social interaction" approach that stresses the careful integration of practical ideas promoted by teachers with the directed support of the administration, parents and local community (Knupfer, 1987). Together these key people provide the necessary practicality and the directed support from outside forces upon which the daily life of classrooms is built. Teachers who develop workable strategies for using computers have a stronger claim on the vital support of administrators and parents who lack practical experience with educational computing but who want to see it succeed. Implementation through social interaction hinges, then, on the ways that teachers transform the opportunities afforded by an innovation into practical, meaningful classroom applications of this technology (see Figure 2).

The teachers' role in the social interaction is crucial, and it depends largely on the preconceptions teachers bring to the implementation of an innovation. Their attitudes about change in the school; their social prejudices about race, class, and gender; their assessments of the students' different ability levels and how to handle them; and their sense of their own professional status and the uncertainties surrounding that status all affect they way they treat educational computing.

Further, as the teachers grope with implementing computers into the schools as we know them, they realize that schooling itself is changing. This change is brought about not only by demands of a changing society, but also by the very presence of computers in the schools. The computers enable the teachers to structure lessons quite differently and in so doing, change the entire process, focus, and outcomes of educational expectations. Teachers are not only directing their students to realize different educational outcomes as a result of using computers, but they are also engaging in

different roles as students experience different processes of learning. The teacher's role is no longer focused on providing information nor is it to be a straight forward facilitator as was believed in the early stages of educational computing. Instead the teacher's role is emerging as learning partner and collaborator in the educational process.

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Figure 1. *Educational Computing and Teachers*

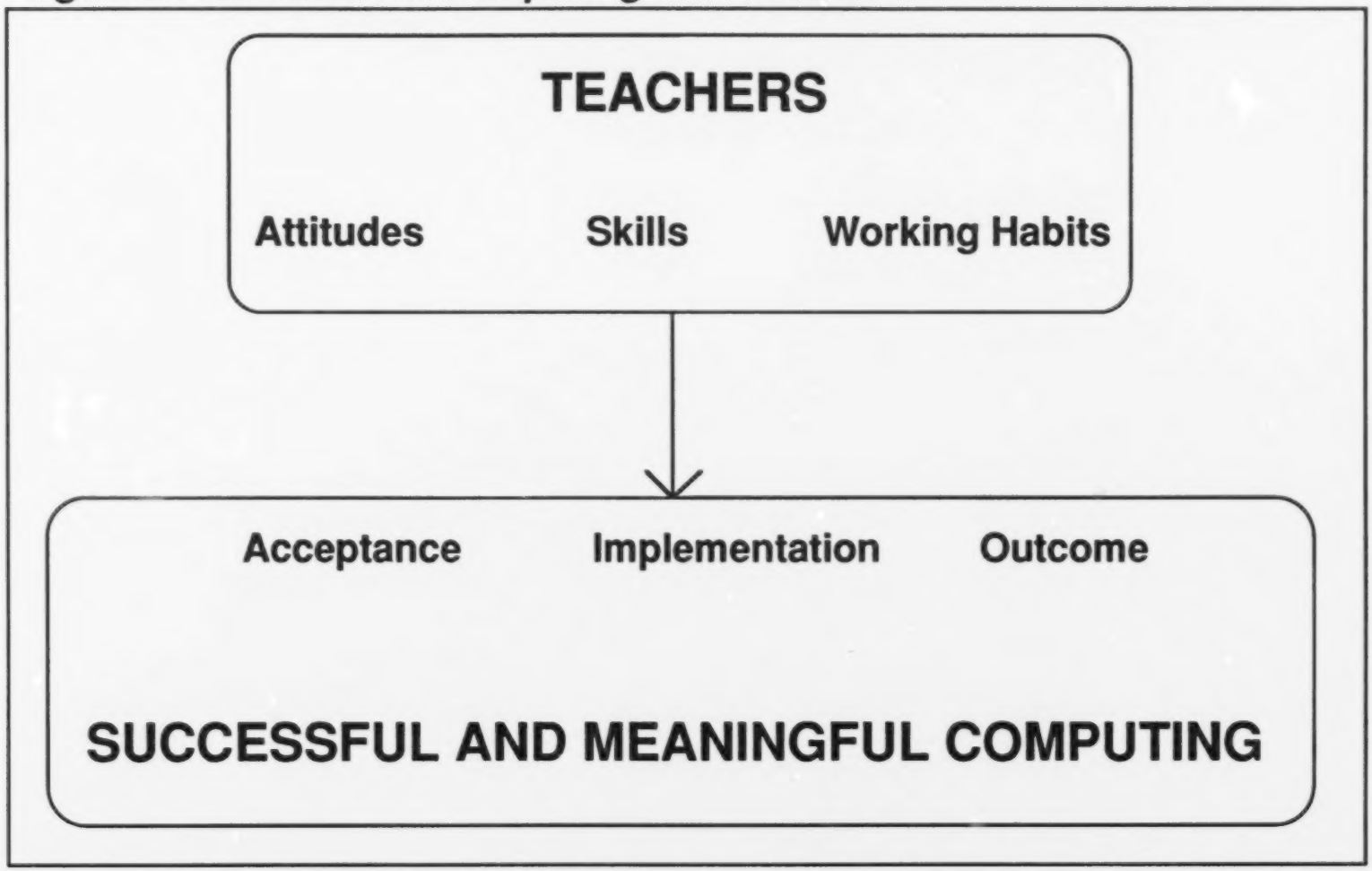
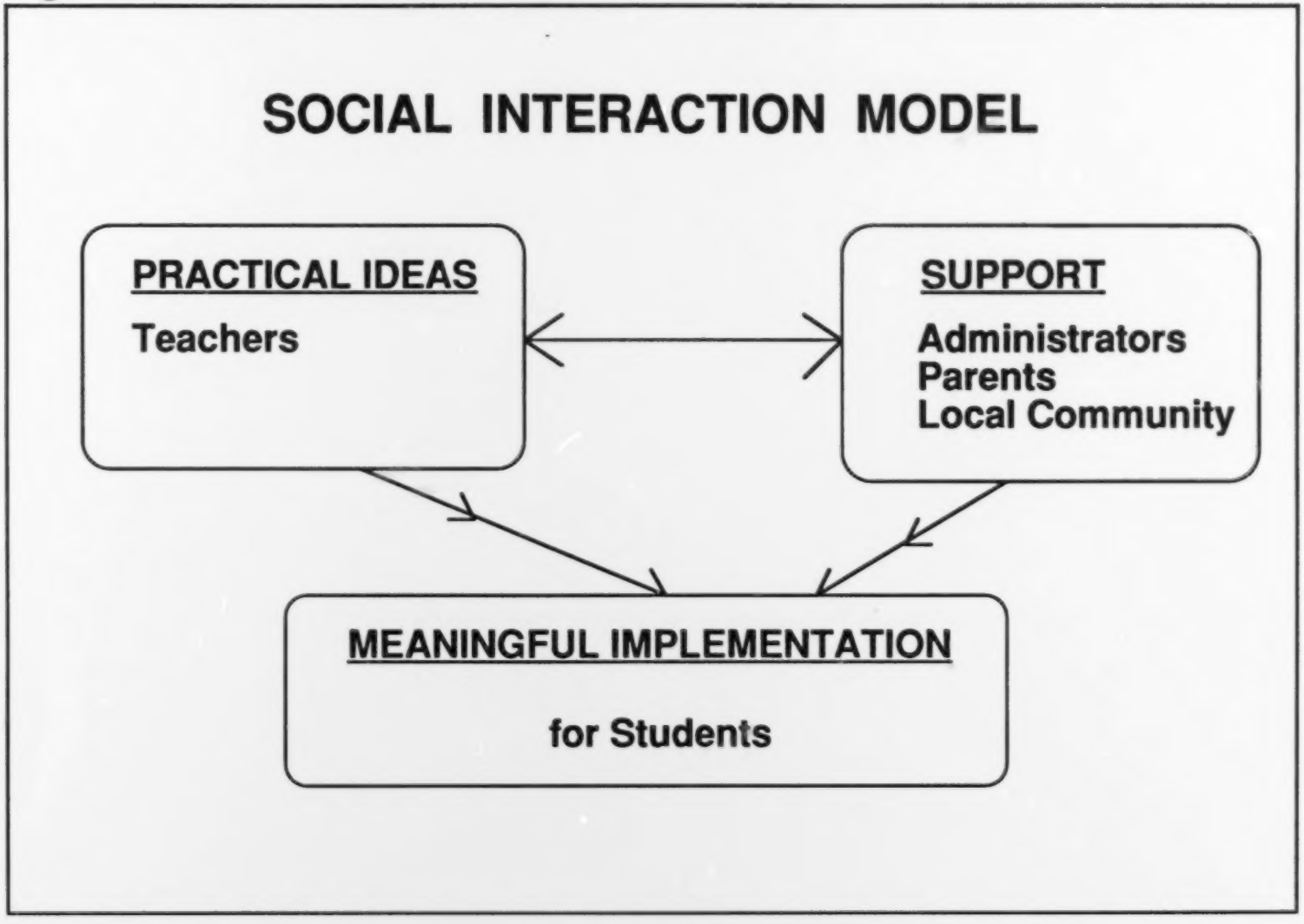


Figure 2. *Social Interaction Model*



Education as Marketplace

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The exponential rise in computer education in the 1980s is usually attributed to the technological innovations which made the microcomputer an affordable machine. Yet, there were many other forces which contributed to the widespread adoption of computer literacy into the curriculum. This paper focuses in on corporate needs and political aims which united to convince educators and much of the general public that we were all suffering from a previously unknown "disease" (computer illiteracy) and that curriculum reform was necessary before this reached epidemic proportions.

This paper concentrates on the twin needs for a trained workforce and to keep our country ahead of others in the areas of economics, research, and science/technology. First it sets the historical context by showing that these needs were driving forces behind the first public education programs, through early vocational training, to the increase in science and technology education in the wake of the launch of Sputnik. It then looks carefully at the moves towards computer education in the 1980s, looking both at which groups of people were the leading advocates and what they stood to gain by this, as well as examining the curriculum itself and whether in retrospect one could say that it was really designed to meet such a pressing need as that vocalized by the leading proponents of computer literacy requirements.

After a detailed historical examination of these issues, the paper points to the following set of conclusions:

Personal computers first appeared in the classroom during a period of major curricular reform and must be viewed within that context. The *back to basics* movement of that period was grounded in the perception that educational reform was necessary to prevent the United States from losing its competitive edge internationally (both economically and politically). Recommendations tended to stress math and science instruction, vocational training, and computer literacy.

Major advocates of computer literacy included corporations, higher education leaders, the military, the federal government, and the scientific community. The corporate world saw mandatory computer literacy as a way of creating a more trained workforce through direct computing skills (such as the use of particular software packages), as well as general skills and habits (working alone for many hours without any human contact, responding to linear/multiple choice situations, etc.). Computer corporations saw this as a way to promote popular interest and support for their activities, as well as a way create a demand for their own particular products. Higher education, the military, the federal government, and the scientific community all viewed computer education as a tool both for maintaining a competitive edge internationally and for securing additional funding for their own agendas which intersected with this.

Advocates from all these areas promoted computer education as a cornerstone of maintaining *progress*. Yet this was a strictly technological view of progress, where humanistic aspects of progress (such as decreasing stratification) were seldom mentioned. They often argued that computer literacy was necessary in order to be a "good citizen" in this society, yet we have seen that few (if any) computer literacy programs discuss the social impact of computers in any meaningful way.

In fact, computer literacy curricula seems to fail even on the level of delivering meaningful vocational skills (due to the rapid technological developments that are changing the nature of computing skills on an almost annual basis). What we are left with is curricula that seems effective in getting people habituated to dealing with computers: typing on keyboards in response to messages on a screen, working without the physical presence of other humans, and thinking in ways that computers (today) require. This is not too different than early public education's function of socializing students in preparation for factory labor.

None of this should be surprising. As the historical examination in the paper has shown, the history of public education has been shaped by the corporate need for a trained workforce and the competitive need to keep America ahead economically and politically. Since the industrial revolution the notion of *progress* has become an unquestioned assumption which our society pursues. The movement for computer literacy in the 1980s has been shaped by the same social forces which have dominated public education since the middle of the last century. As long as the forces that shape the rest of society remain basically unchanged, we can expect future successful movements for educational reform to be subject to similar influences.

Landra L. Rezabek

Computers and Copyright: The Unpopular Dilemma

Abstract

The increasing use of microcomputers in schools across the nation is paralleled by a growing concern that computer technology be used responsibly. One of the many concerns associated with responsible use of computers is the issue of copyright. Educators are, or should be, particularly sensitive to copyright issues. Yet, the problem of computer-related copyright violations in schools continues to be one of national concern. The purpose of this paper is to: 1) briefly explore microcomputer copyright issues in the context of educational use, 2) outline considerations for educators interested in taking steps to resolve some of the problems associated with computers and copyright issues, and 3) raise additional social issues associated with copyright laws and the educational use of microcomputers and emerging computer-based technologies.

Computers, Classrooms, and Copyright

Computers offer a variety of instructional advantages in the classroom, yet the increasing number of microcomputers in schools across the nation has generated significant concern regarding associated ethical and legal responsibilities of computer-using educators and students. The implications which copyright legislation and guidelines have for the judicious use of computer hardware and software is an area in which concern is growing as the number of computers in schools increases. The misuse of hardware and the illegal duplication and abuse of software in violation of federal copyright legislation have risen to epidemic proportions (Brunner, 1988; Bullock, 1986; Thornburg, 1986). And though the severity of the copyright problem has been documented, few solutions to the copyright quandary have been offered.

Unfortunately, computer technology has evolved faster than the legislation which governs its use, and current copyright laws and guidelines are somewhat ineffective in providing direction for a concerned public (Brunner, 1988; Sacks, 1985; Talab, 1986, White & Hubbard, 1988). It also appears that the existing copyright laws and guidelines are not widely acknowledged by educators. Many concerned observers (ADAPSO, 1984; Bullock, 1986; EDUCOM & ADAPSO, 1987; Helm, 1984; Thornburg, 1986) call for educators to increase their awareness of copyright legislation and guidelines, believing, perhaps naively, that increased knowledge of the law will result in increased adherence to copyright legislation. But as Helm (1985) asserts, when educators violate computer-related copyright laws, "Some do so in blissful ignorance, others with vague intuitions of wrong-doing, and regrettably a few knowingly and blatantly ignore the frustrating restrictions contained in the copyright law" (p. 2). Awareness of copyright laws and guidelines may serve to enlighten the ignorant and vaguely uncomfortable copyright offenders, but few sources offer suggestions for convincing the cognizant infringers that their actions are unethical and illegal according to federal statutes.

Educators often assert that their responsibilities as teachers absolve them from adherence to the copyright laws. Educators may claim that copyright violations are justified by their noble goals of providing the best possible educational experiences for students. But the use of microcomputers in educational settings does not justify illegal actions, and teachers and students must be held accountable for their uses of microcomputer technology.

Though copyright legislation and guidelines pertain to the uses of computer hardware and software in businesses and homes as well as in schools, the misuse of computer technology in schools is of particular concern. As Bear (1986, p. 114) notes, schools are one of the most powerful and pervasive influences on the ethics and morals

of young people and schools must prepare students to "recognize, comprehend, and evaluate the general impact of computers, as well as specific issues involving the use of computers." Schools, therefore, have an obligation to introduce students to the legal responsibilities of computer use, including copyright laws and guidelines. In addition to teaching students about the implications of copyright legislation for computer use, teachers also are called upon to serve as role models who demonstrate ethical and appropriate uses of computer technology and who are aware of and adhere to copyright guidelines in their professional practice (Bullock, 1986; Niemeyer, 1986). To further complicate the situation, the dilemma of encouraging educators and students to abide by copyright laws and guidelines is one which will be exacerbated by the development of new computer-based technologies before many of the existing copyright problems are resolved.

Technological Advances and Copyright Concerns

Though the Copyright Act of 1976 and subsequent 1980 amendments provide basic guidance for the legal uses of computer hardware and software, advances in technology already have created a need for additional and more inclusive copyright legislation and guidelines. For example, a variety of computer-accessed informational, interactive, and multimedia options such as compact audio discs, video discs, video tape, electronic databases, and bulletin boards can be linked by computers to provide educational and informational opportunities for students and teachers. Students and teachers certainly can use these types of hardware and software legally and advantageously in classrooms. However, they also can engage in electronic cut-and-paste techniques to incorporate information directly from these resources into their own products. This accessibility of information and resources not only raises issues of electronic plagiarism and privacy of information, but also raises copyright concerns.

Though some electronically-accessed words, sound, and images are authorized for use in classroom productions, access to these sources of computer-based information creates numerous copyright problems that are not as yet clarified in the laws and guidelines. Teachers and students must be made aware of the responsible uses of computer-accessed multimedia and informational resources in much the same way that they must be made aware of copyright guidelines directing the use of more traditional media such as film, audio cassettes, and videotape. While D'Ignazio (1990) stresses that both teachers and students must become aware of copyright issues arising from the use of multimedia resources, he also acknowledges that current copyright laws provide little clear guidance in dealing with problems created by emerging technologies.

Computer-related copyright issues relating to multimedia resources and emerging technologies may require familiarity with guidelines and legislation pertaining to existing laws addressing computer, print, video, audio, and other formats if students and educators are to use the new hardware and software in an ethical manner. But in order to use copyrighted materials within the law and to teach students the legal responsibilities associated with the use of computers and multimedia hardware and software, educators will need to constantly monitor the copyright laws and their implications for the uses of emerging technologies. Unfortunately, the technologies emerge more rapidly and also are more readily acknowledged than do the laws and guidelines developed to oversee their use.

Educators and the Future of Copyright Law

Efforts can be made to encourage teachers to abide by the copyright laws, but it will take the concerted efforts of the entire educational community to resolve many of the issues and questions associated with the legal uses of computer hardware and software. Not only teachers and students, but administrators, district coordinators and

supervisors, library media specialists, support staff, and parents must cooperate to increase awareness of and adherence to existing copyright laws regarding the use of computers in schools. But the educational community has an important responsibility in addition to raising awareness of copyright laws and encouraging teachers and students to abide by them. As Brunner suggests, "Society must either uphold the current laws or change the present laws in accordance with their beliefs" (1988, p. 17). Those concerned about the educational uses of microcomputer hardware and software may believe that the current copyright laws are inappropriate in an increasingly technological society. Those with this conviction should serve as advocates for changing and clarifying copyright legislation to keep pace with technological innovations. As noted earlier, the copyright laws have traditionally failed to adequately address issues generated by advances in technology, and this trend continues. Educators who are bewildered and frustrated by the lack of guidance which current laws provide or who believe that educational uses of computer technology demand more consideration than is currently afforded by the law must become actively involved in the resolution of these and other computer-related copyright issues.

It is important for teachers and students to know and to abide by existing copyright legislation, but it is also important for those who live under the law to voice their needs and convictions. The generation of copyright law has been an attempt to balance the rights of owners of copyrighted works with the needs of those who use the works, and the act of balancing is not a static process. It is up to the educational community to adhere to current laws or to advocate a new legal balance. What must not continue is the blatant disregard for computer-related copyright laws often demonstrated by educators. Educators must be responsible for their use of existing and emerging technologies and by their consistent words and actions must encourage students to do likewise. Until copyright laws are modified, an event for which educators are at least partially responsible, teachers and students must know and abide by existing copyright laws and their implications for the responsible use of computer hardware and software.

Copyright, Computers, and the Broader Social Context

The suggestion that educators should advocate changes in copyright laws raises the legitimate question of for whose benefit copyright legislation is enacted. As indicated above, the original intent of copyright law was to balance the needs of those who use copyrighted materials with the rights of those who own the copyright to the creative endeavors. The fact that educators wish to use copyrighted materials in non-profit educational contexts does not grant them permission to do so indiscriminately. Though educators are granted some latitude in the use of copyrighted materials, as outlined in the Fair Use Doctrine and other copyright legislation and guidelines, copyright laws nevertheless limit the educational uses of materials, including the educational uses of computer hardware and software.

Some of these limits to the educational uses of computer hardware and software are quite apparent and are spelled out in legislation and guidelines concerning issues such as the duplication of software, site licensing, and networking. However, the limits to the educational uses of computers that are indicated by copyright legislation are often more subtle and raise questions about the educational uses of copyrighted computer materials as part of the larger social context. For example, educational organizations which adhere to copyright legislation and guidelines would necessarily need to allocate more funds for the purchase of software than would those who illegally duplicate software. Certainly, software producers suffer financially when educators pirate software, but what is the cost to students, teachers, and society when school districts financially cannot provide access to copyrighted computer software? Will students in financially less affluent districts have access to instruction and

information provided through computer-based platforms, and if not, how will this deficit impact society? Certainly, inequities in funding have existed for years in school districts across the nation and continue to plague education. But the potential of computer hardware and software to provide both instruction and information once more underscores the issue of equitable access to the tools of education and the keys to knowledge. If copyright legislation prohibits students in less affluent districts from access to computer-based instruction and information, are the laws in the best interest of society? If not, how should they be modified to reflect the changing needs of education and society that have been precipitated by advances in technology? And how can the needs of students and educators be balanced with the rights of those whose creative efforts result in computer hardware and software traditionally protected by copyright legislation?

Obviously, there are no easy answers to these questions. Existing legislation suggests an ethical code of behavior for educators as discussed above, but issues regarding the educational uses of computers in the larger social context generate questions that are as yet unresolved and that eventually may lead to a new social ethic as well as to new legal guidelines for the educational uses of copyrighted computer-based materials.

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